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TD2M/TD3M

2 Phase Micro Stepping Motor Driver User's Manual

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Precautions

Precautions for using

1.Thank you for purchasing TROY products. Please read this user's manual thoroughly before installing and operating the driver, and always keep the manual where it is readily available.

2. The products described in this manual has been designed and manufactured for use in industrial machinery, and must not be used for any other purpose. We are not responsible for any damage caused through failure to observe this warning.

3.Check that the motor, driver and any accessories are all present. If an accessory is missing or damaged, contact the nearest our branches.

4.Never disassemble the motor and driver. Damage or performance impairment may result. Disassembly voids all warranties.

Precautions for maintenance

Check the ambient environments, clean the system equipment to remove dust and tighten the screws periodically. Also pay attention to the followings.

1. Contact us when repairs become necessary.
2. Since the temperature of the frame of the driver can rise high, be careful when conducting maintenance work or inspection work

Precautions for warranty period

Within the period of one year after delivery of the system equipment, when failures occurring from design error or fabrication error attributable to the manufacture side occur, we will be repairing the failure free of charge within the reparable range or will replace with substitute.
(We cannot hold ourselves responsible for breakage and accidents occurring from your use beyond the specified range described in this document.)

Precautions for disposal

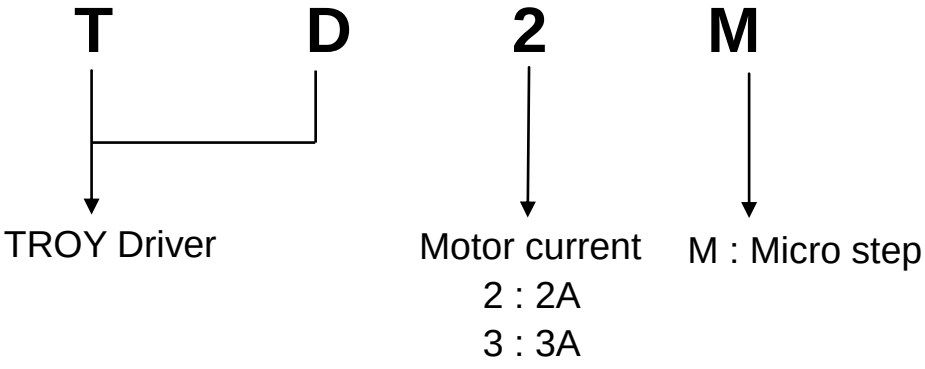
When disposing of the driver and the motor, treat them as ordinary industrial waste.

1. Product specs

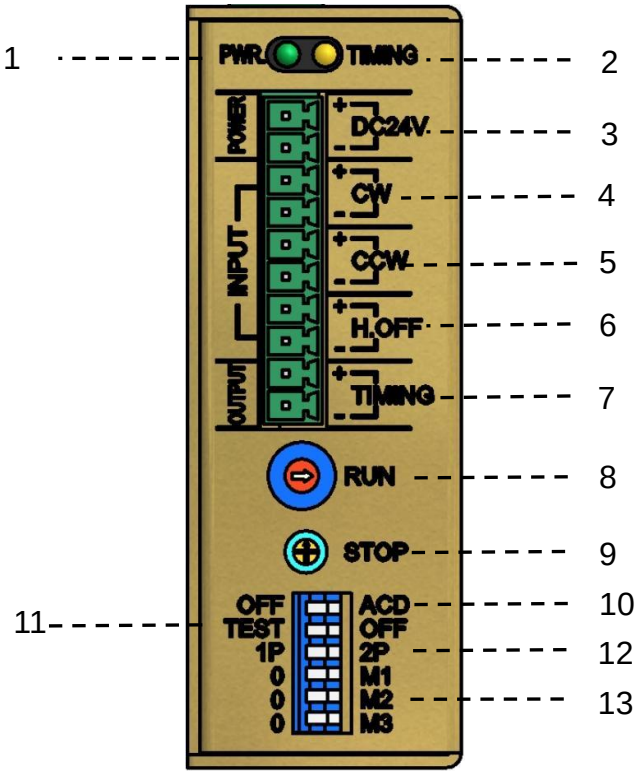
●Specs

Driver model		TD2M	TD3M
Drive current		0.1~2A/phase	0.52~3A/phase
Power input		DC24V~36V Min : 3A	DC24V~36V Min : 3.6A
Excitation mode		Microstep with the resolution 200~3200 dpi 1.8°~0.1125°/Step	
Signal output & input mode		●Photo coupler input ●Open collector output	
Input signal	CW pulse input	2 pulse:Clockwise rotation input；1 pulse:pulse input	
	CCW pulse input	2 pulse:Counterclockwise rotation input 1pulse:Rotation direction input	
	H.OFF input	Excitation release input (Holding off)	
Output signal	TIMING output	The signal is output every time the excitation sequence returns to the initial stage"0" TIMING LED lit up continuous when the resolution is 200 dpi Signal output every 2 pulse when the resolution is 400 dpi Signal output every 4 pulse when the resolution is 800 dpi Signal output every 8 pulse when the resolution is 1600 dpi Signal output every 16 pulse when the resolution is 3200 dpi	
Functions		●Automatic current cut back (ACD) ●Self-test (TEST) ●Overvoltage protection on the signal terminal (5~24V)	
Protection functions		●Inverse power protection: auto disconnection in the case of reversed voltage polarities ●Out of phase of the motor cable ●Wrong connection of the motor phase ●Motor short circuit protection	
Light display		Power/TIMING	
Dimension(mm)		90(L)X65(W)X32(H)	
Weight		174g	
Ambient temperature		0℃~40℃	

●Driver name and product number code



2. Names and functions of driver parts



Front panel

No.	Display	Type	Name of the functions	Functions	Notes
1	POWER	LED	Power indicator	Lights when power is on	
2	TIMING	LED	TIMING indicator	Lights when TIMING signal is output	
3	DC24V/36V	I	Power positive pole input (+terminal)	External power positive pole (V+)connected to this terminal	DC24V~36V
			Power ground input (−terminal)	External power negative pole(V-)connected to this terminal	
4	CW	I	2 Pulse:CW pulse signal input	Clockwise rotation pulse input	L:0~0.5V H:4~5V Input impedance →220Ω Input current →Max.20 mA
			1 Pulse:Pulse signal input	Pulse input	
5	CCW	I	2 Pulse : CCW pulse signal input	Counterclockwise rotation input	
			1 Pulse : Rotation direction input	"L" level CW rotation,"H" level CCW rotation	
6	H.OFF	I	Holding torque release	Input the(L)level to released the holding torque and motor shaft can be rotated by hand	
7	TIMING	O	Excitation timing output	Outputs signals when the excitation sequence is at STEP"0"	
8	RUN	SW	Motor run current switch	For adjusting the motor running current	Default:A

9	STOP	VR	Motor stop current switch	For adjusting the current dropping rate at motor standstill	Default:50%

※ The indication of type: LED : LED indicator, SW: Switch, VR: Variable resistor, I: Input contact, O: Output contact

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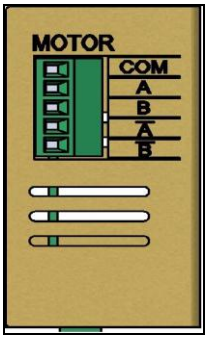
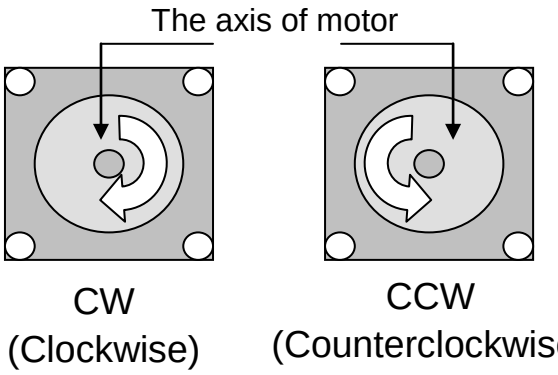


Left side of panel

No.	Display	Type	Name of the functions	Switch	Functions	Notes
10	OFF/ACD	SW	Automatic current cutback	OFF side	After pulse input stop, motor current stay at the motor running	Default:ACD ※ACD function can prevent the temperature rising
				ACD side	After pulse input stop around 0.1 sec, motor current decrease automatically and the temperature will lower down. The drop rate adjusted by STOP-VR	
11	TEST/OFF	SW	Self test	TEST side	Driver rotated in CW direction by 2pps.	Default:OFF
				OFF side	Self test function stops and please flick to the OFF side when motor running	
12	1P/2P	SW	Pulse input mode	1P	1 Pulse input	Default:2P
				2P	2 Pulse input	
13	M1/M2/M3	SW	Resolution adjustment	000	200 dpi with current 70%	Default: 1600dpi
				001	200 dpi with current 100%	
				010	400 dpi with current 70%	
				011	400 dpi with current 100%	
				100	800 dpi	
				101	1600 dpi	
				110	3200 dpi	
				111	HOLD.OFF	
14	MOTOR	O	Motor connector		Connecting the motor	

※The indication of type:LED:LED indicator,SW:Switch,VR:Variable resistor, ｜:Input contact,O:Output contact

The front view of motor



3. Potentiometer for adjusting motor current

1.Adjusting the motor running current

a.Adjusting the motor running current by 『RUN』switch

TD2M : Adjusting range0.24A/phase~2A/phase

TD3M : Adjusting range0.52A/phase~3A/phase

b.The default current value setting at scale「A」

TD2M : Rated current is 1.28A/phase around 64% of rated current

TD3M : Rated current is 2.16A/phase around 64% of rated current

★Please note the driver RUN current value do not over the motor rated current value A/phase★

The dial settings and corresponding levels of motor operating current for TD2M/TD3M as below:

Scale	TD2M Operating current(A/phase)	TD3M Operating current(A/phase)
0	0.23	0.52
1	0.23	0.52
2	0.25	0.6
3	0.38	0.8
4	0.49	1
5	0.61	1.2
6	0.73	1.36
7	0.86	1.56
8	1	1.76
9	1.13	1.88
A	1.28	2.16
B	1.43	2.32
C	1.58	2.48
D	1.73	2.64
E	1.89	2.84
F	2	3

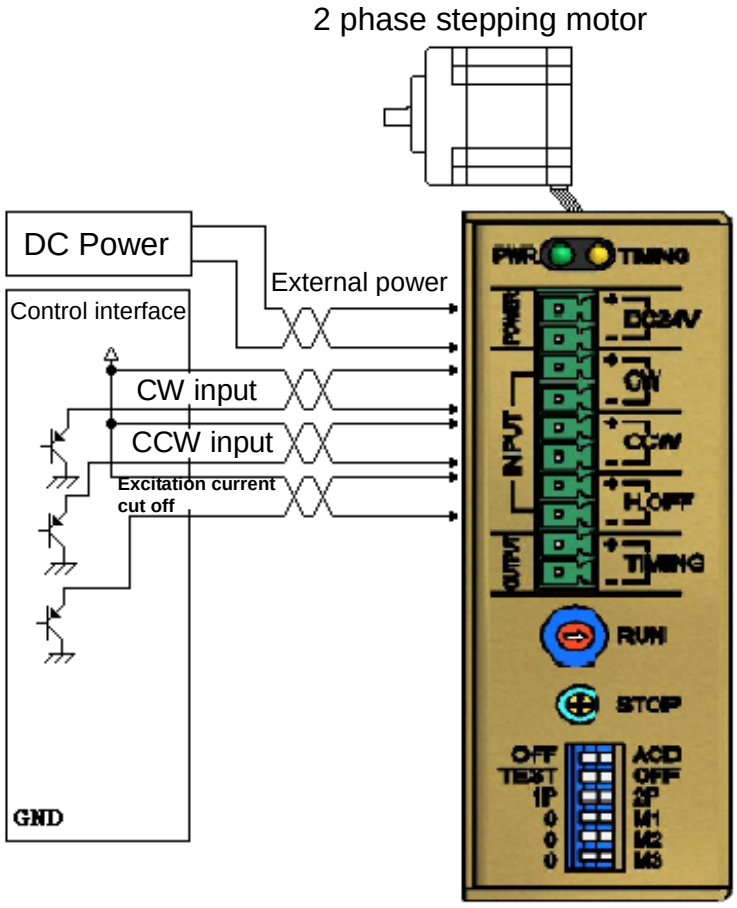
2. Adjusting the motor current at standstill by「STOP」switch

The switches sets the amount of reduction in motor current relative to the operating current at 10 different levels between 0~10.The motor current in the stopped state will be operating current multiplied by the set cutback rate and the rate range is from 10%~65%.

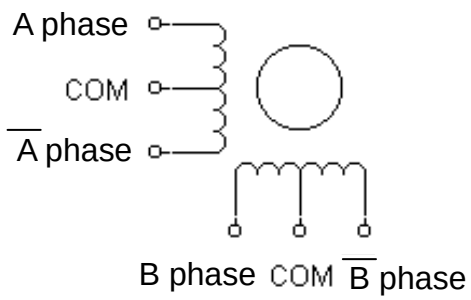
The dial settings and corresponding levels of motor operating current as below:

Scale	Current cutback rate(%)
1	10
2	10
3	20
4	30
5	40
6	48
7	52
8	58
9	60
10	64
11	65

4. Wiring diagram



2 phase stepping motor internal wiring



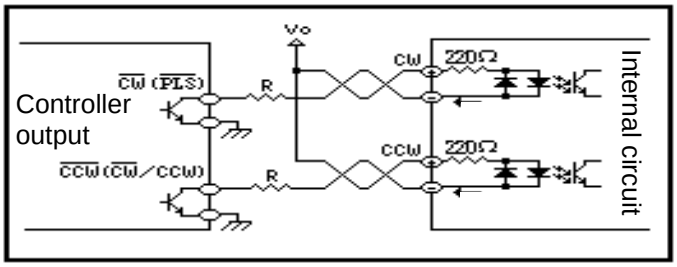
Motor wiring chart

	TROY	SANYO DENKI	Tamagawa		ORIENTAL
				TS3103N40	
A	Black	Orange	Black	Red	Black
COM	Yellow	White	Yellow	Black	Yellow
/A	Green	Blue	Green	Red/White	Green
B	Red	Red	Red	Green	Red
COM	White	Black	White	White	White
/B	Blue	Yellow	Blue	Green/White	Blue

※The different specifications of SANYO103-8□□series has different wiring method, please contact to us 「**sales@troy.com.tw**」

5. Wiring &Operation

5.1 Pulse DIR Input



★Note: the signal input voltage range is 5V ~ 24V, it can be used without limiting resistor.

(1) 2 pulse input mode

The negative edge-triggered input is employed. The motor stays at ''H'' level when no pulse signal input.

The pulse signal goes to CW terminal and the motor rotated 1 step in clockwise rotation.The pulse signal goes to CCW terminal and the motor rotated 1 step in counterclockwise rotation.

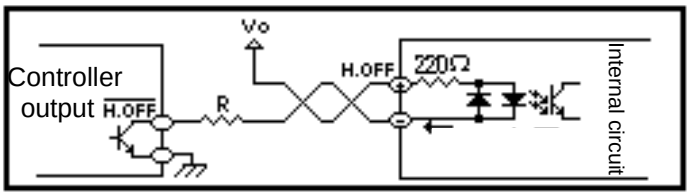
(2) 1 pulse input mode

The negative edge-triggered input is employed. The motor stays at ''H'' level when no pulse signal input. The pulse signal goes to CW terminal, while the operating rotation signal goes to CCW terminal. CCW rotation in"L" level CW rotation in"H" level.

(3) Pulse voltage range： 4~5V for ''H'' level, 0~0.5V for ''L'' level.

(4) Pulse width＞5 μ sec minimum, up/down time ＜2 μ sec maximum

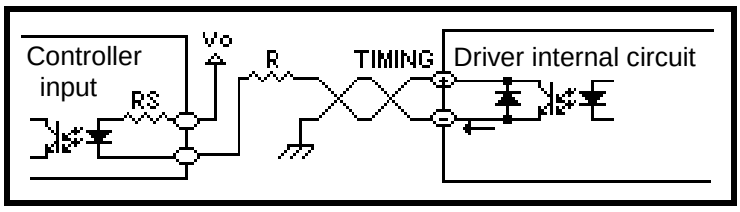
5.2 H.OFF Input



★Note: the signal input voltage range is 5V ~ 24V, it can be used without limiting resistor.

※When control signal H.OFF is "L" level, the motor current stop then motor's holding force release.

5.3 TIMING Output



★Note
Please add proper external resister(R) to keep
the current of circuit under 10mA

$$R = \frac{Vo}{10mA} - RS$$

This timing signal is output to indicate when the motor excitation is in the initial stage(step "0" at power up)The TIMING lamp is lit up continuously during the operation with high speed and transistor is on.

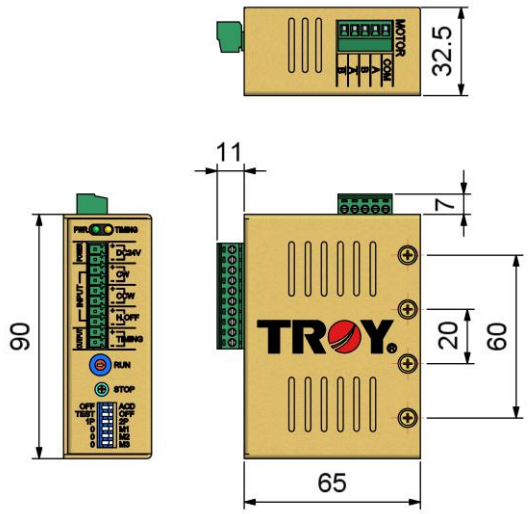
TIMING lamp lit up continuously when 200 dpi
TIMING signal outputs when input every 2 pulse with 400 dpi
TIMING signal outputs when input every 4 pulse with 800 dpi
TIMING signal outputs when input every 8 pulse with 1600 dpi
TIMING signal outputs when input every 16 pulse with 3200 dpi

5.4 Protection Functions

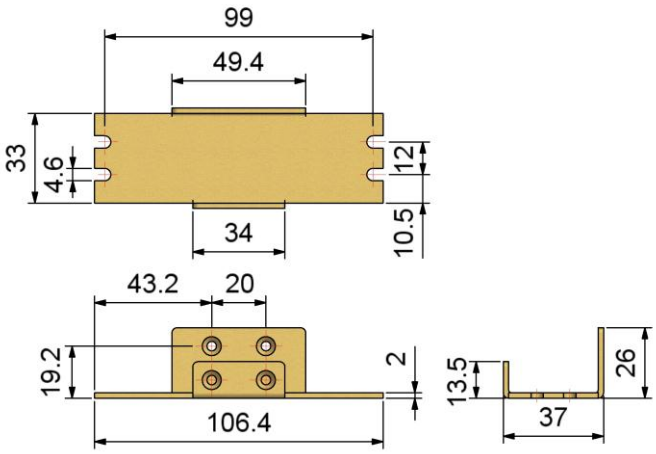
Explanation of protection functions	Activation	Action
Inverse power protection	No power	Checking the positive and negative level from the power
Out of phase of the motor cable	Power lamp flicked	Checking is any out of phase from the motor cable
Motor short circuit protection	Power lamp flicked	Checking is any short circuit from motor cable
Wrong connection of the motor phase	Power lamp flicked	Checking the phase sequence of motor cable

※When the power lamp blinking indicates the motor wiring has abnormal situation.
Please recheck the motor wiring is correct or not.

6. Dimension & installation



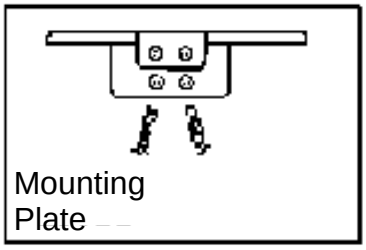
Driver dimension

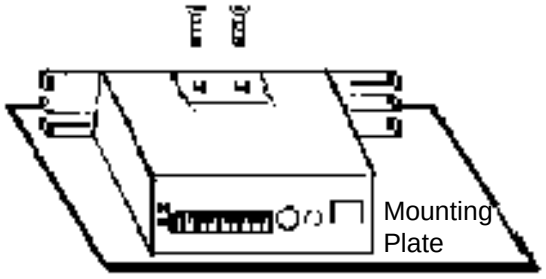


Mounting bracket dimension

●Driver installation mode

1.Horizontal installation





＜Step 1＞

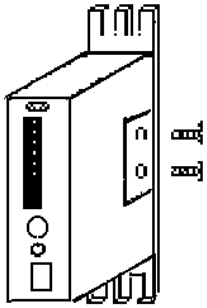
Lock the installation seat onto the mounting plate by using 2 screws

＜Step2＞

Fit the driver into the groove of mounting plate. Mounted with 2 screws

2. Vertical installation

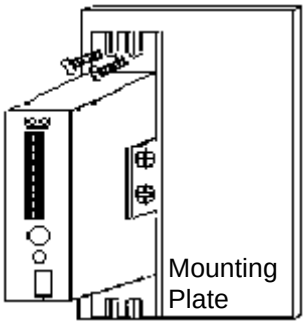
Method 1.



＜Step 1＞

Remove the middle 2 screws of driver. Vertically fit the driver into the groove of the mounting base.

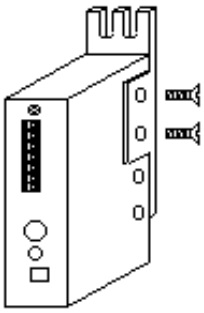
Then re-mount the 2 removed screws



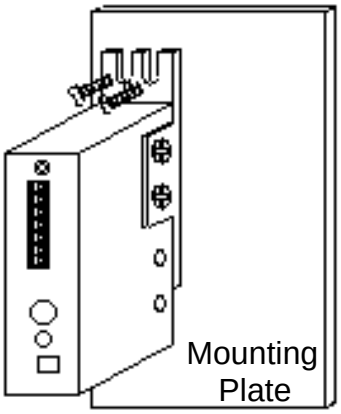
＜Step 2＞

Lock the mounting bracket on the mounting plate by using 4 screws

Method 2.



＜Step 1＞
Remove the middle 2 screws of driver. Vertically fit the driver into the groove of the mounting base.
Then re-mount the 2 removed screws



＜Step 2＞
Lock the mounting bracket on the mounting plate by using 2 screws

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http:// www.troy.com.tw

※ Environmental Responsibility

- TROY is always committed to environment protection. All packaging material is recyclable and reusable.
- If disposing of used product, please recycle by type as per waste disposal procedures.

----------Protect the green earth with your care and commitment----------

※The product is subject to design modification for performance improvement without prior notice. For more details, please contact with your local seller.

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